ARIZONA ARCHITECT

SEPTEMBER 1959, Vol. 3, No. 1

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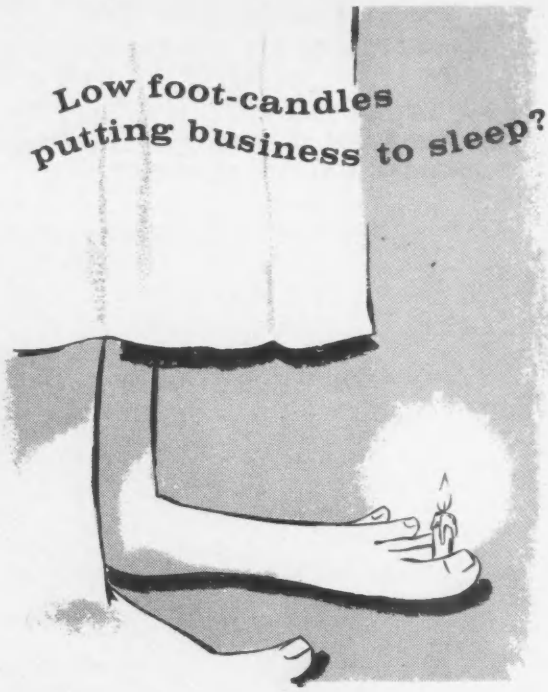

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THE PRESIDENTS' PAGE

CENTRAL ARIZONA CHAPTER

John Brenner

SOUTHERN ARIZONA CHAPTER

Edward H. Nelson

GONE FISHING! That's right, that's exactly what I've been doing most of the time since I last tried to fill this space with stuff about architects and architecture, and I want to thank Vice-president Jimmie Nunn and Secretary Kemper Goodwin for their excellent contributions to this page during my absence.

It has really been a glorious summer for me, spending much of my time sitting in a rowboat dangling a minnow on a hook into the clear blue waters of the lake, just wondering when the next walleyed pike, black bass or Northern pike (pickerel) will suddenly grab the bait, take off and keep me busy until I finally get him in my landing net. You sometimes wonder if there isn't some kind of a lure you can use to excite and attract the next potential client. There probably is, and you may have a tough time landing him after he's taken to the bait. He might even just nibble a bit and then drop it, and be long gone before you get another bite. Then after you've landed him, and let's hope he's a beauty, there're the chores to be done.

The fish must be properly cleaned, neatly filleted, sprinkled generously with stone-ground cornmeal, a blazing hot fire built under a long-handled skillet, and then cooked to a golden brown in plenty of smoking hot grease. Don't forget, there's also the final cleaning up and putting out the fire.

So it is with a client: first there are preliminaries to be gone through and neatly prepared; then the fat's in the fire and you're ready for the working drawings. When they're done and the contract's let, you may have satisfied his appetite to the point of sitting back and lighting up a stogie, but you, the cook, still have the final clean-up job of supervision, final settlement and leaving the client with a contented, satisfied and genuinely happy feeling about the overall results.

Heck, man, this hasn't been a vacation. I've been working all the time and didn't know it.

Who wants to go fishing?

AT THE NATIONAL convention, Ed Stone pointed to signs of an emerging period of cultural maturity in our country and asked the architects to assume a place of leadership in this renaissance.

He repeated the familiar thought "that man is the result of his heredity, his education and his physical surroundings," and called on the architects to fulfill their mission by creating a beautiful environment for man. He admits that this is a task requiring education of the people to appreciate and to require beautiful surroundings. It also calls for the influencing of responsible leaders in business and government to realize that beautiful surroundings are a natural asset; as important to our well-being as flood control or preservation of our national forests.

Stone pointed out that architects are keenly aware of the deficiencies and ugliness in our environment which are uneconomical as well as irritating. They see that our highways are a nightmare of billboards, honky tonks and filling stations, and they should be taking an active part in obtaining legislation to control these nuisances.

Architects know that automobiles and pedestrians do not mix well; that grass should be growing on Main Street with parking around the central shopping district rather than on its streets.

They know that the graceless detached house on its 70 or 80 foot x 100 lot is devoid of privacy, uneconomical to maintain and is eating up the countryside at an alarming rate.

With their knowledge, training and ability, why aren't the architects planning some prototype communities and subdivisions of multiple dwellings? Why aren't they working on legislation so that open space within and outside the cities can be preserved? Why aren't they more concerned with securing recreation areas and oases for quiet rest and contemplation within our growing communities? Being busy or having their attention glued to the next commission is not much of an excuse.

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The Editor's PERSPECTIVE

MANY OF THE MOST beautiful and romantic words in our language are associated with, or descriptive of light. This fact alone suggests the significance of light in our environment. And it suggests that architects, concerned as they are with beauty, should be in constant search for ways to capture the moods of light and apply them to their designs.

Consider the connotations and your own emotional associations of these words: dawn... twinkle... luminous... alpenglow... twilight... aurora... moonlit... beacon... glow... glitter... glisten... spangle... shimmer... rainbow... glimmer... lambent.

The Southwest has its own distinctive kind and quantity of natural light, which makes it a unique factor in our regional architecture. The apparent nearness of distant mountains and of the stars at night amaze visitors to our desert country. Even the brightness of our sun makes shadows deeper.

Both the brilliance and abundance of Southwestern light – and the heat that accompanies it – present opportunities and necessity for a characteristic architecture. And they present distinct problems of light control and of thermal insulation.

By this issue of *Arizona Architect* we hope to invite special preoccupation with matters of light and lighting. We challenge some architect and his illumination engineer to create an effect in architecture that will somehow (perhaps only subconsciously) remind us of a High Sierra alpenglow or of the light spangles across a granite-locked lake. Such would be elements of the delight that architecture can and should convey.

One good place to get information and inspiration for more effective illumination is the book, *Lighting in Architecture* (Reinhold, $15), a recent translation of the original German edition *Lichtarchitektur* by Dr. Walter Kohler, with a pictorial narrative conceived and arranged by Architect Wassili Luckhardt. (Available from Architects Book and Magazine Service, see P. 26.)

The first part of the book, in pictures, suggests new luminous forms in a broad sweep, from complete edifice to minute detail.

In a second section the illuminating engineer provides an exposition of his field for the benefit of other construction specialists. In it a conscious effort is evident to make the technicalities and terminology of the profession understandable. In this section the author introduces general considerations concerning light, color and form and their effects on man. The last section deals with practice in lighting, illustrating, describing and criticizing existing installations.

Man is a predominantly visual being. "Just as the whole of organic life on earth is made possible by light and is inconceivable without light, so man is dependent on light in his becoming and in his being, determined by light in his sensation and in his perception. Physically, physiologically, and psychologically regarded, man in his unity of body, mind, and spirit is a creature of light.

"Apart from occasional and additional . . . sense perceptions, light not only gives us our impression of any space, but actually creates it in its effect upon us within and without, in natural as well as artificial illumination. Accordingly, light is for artists – painters, sculptors, architects – one of the cardinal plastic principles . . . In essence, therefore, architecture is an art in light."

The author traces the history of illumination to the point where the "solitary art of producing light, or illuminant engineering, was now joined by that of applying light, or illuminating engineering.

"Knowledge previously gained by individual pioneers concerning the processes of vision was now further explored from the point of view of lighting.

"Physical and physiological researches were promptly supplemented by psychological ones – the study of the psychological effects of light on the human subject."

The author suggests that "to enlist the force of light in the service of architecture, to make full use of the powers immanent in 'building with light,' there must be an intensive collaboration of architect and illuminating engineer, from the preliminary plan onward – a balancing of the two approaches." He quotes Walter Gropius:

"Since the success of democracy depends on capacity for co-operation, it cannot be sufficiently emphasized that the architect, whose chief professional function should be to coordinate the whole construction process, must necessarily evolve a new technique of collaboration. The essence of that technique must be individual initiative, not arbitrary decree."

The author clearly distinguishes light when judged as a tool for the lighting of work space, from those properties and effects of light that constitute a mood factor, as in rooms intended for recreation or for cultural activities.

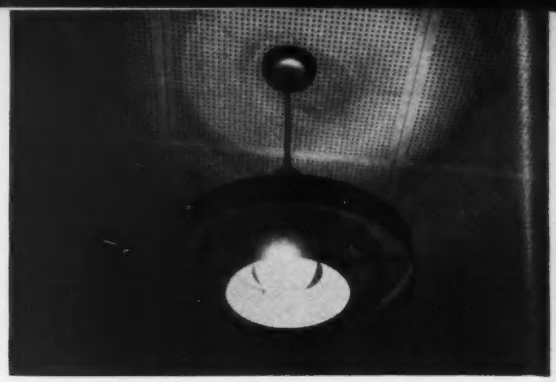
In the words of Goethe:..

"Light transmits the visible to the eye;
The eye transmits it to the entire man.
The ear is mute, the mouth is deaf;
But the eye both understands and speaks."

Phil Stitt

Please—

Let There Be Light



By William B. Keller, P.E.

Having spent most of my life in Cleveland, Ohio, one of the two locations in the country which has the fewest days or hours of sunshine per year, I found the Arizona weather very easy to take. The bright, cheerful sunshine gives one a psychological and spiritual lift which compensates, in part, for some of the deficiencies of the area.

The sunshine itself, however, has created problems unique to our desert country, including, most prominently, water supply and temperature control.

Another problem, though, which is seldom recognized and consequently is almost completely overlooked is that of light and its control. Our senses do not respond as dynamically to light as they do to heat and cold, so it is natural that the control of temperature has been given a great deal more consideration. Only the blind have a comprehensive appreciation for sight and seeing.

Children have an instinctive affinity for the daylight hours, perhaps because sunshine seems to dispel many of the hidden fears that darkness brings. Adults, however, seldom realize that lighting of low levels and poor quality is one of the major factors contributing to our headaches, nervous tension, mental and physical exhaustion and, of course, eyestrain.

We adults have our eyes checked periodically and many of us turn to using glasses for the first time. But, before the doctor's bill is paid, most of us return to our seeing tasks in offices and shops where brightness, glare and other characteristics of bad illumination still exist.

(Our desire for sunshine and light could not be any more vigorous, for we insist on huge picture windows and walls of glass plate or block in our homes. Then,

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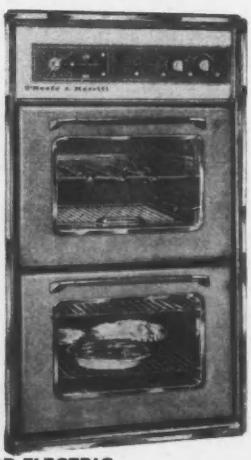

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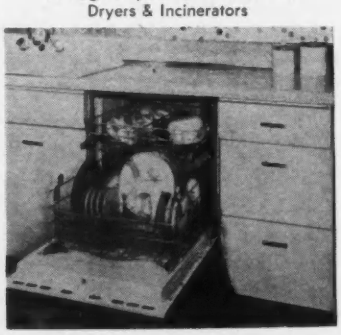

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being fully cognizant of the need for a method of controlling the sunshine, we install blinds, draperies, shades and baffles to keep out or cut off the light that penetrates the glass vistas.)

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Artificial light and lighting systems have been relegated in this area to a position of relatively little importance since we are blessed with an abundance of natural light. It is a normal trend, therefore, to find in office buildings and classrooms, for example, only one row of bare lamps or open tubes centrally located. We fail to realize that the 10,000 foot-candles of sunlight available outside at noon on a cloudless day drops off to 125 to 150 foot-candles just inside our glass wall areas, or that by the time we cross the 20 to 26 feet of the average classroom and reach the inside wall, perhaps with a blackboard, we have dropped down to somewhere between six to 10 foot-candles.

Statistics available now during a gradual awakening of interest in the necessity of *quantity* and *quality* lighting systems indicate that about 85 per cent of all offices, homes and industrial plants are poorly lighted.

In Arizona we recently studied light levels in offices, industrial plants, homes and supermarkets. In the newer office buildings we found a range of from three to 85 foot-candles at desk level, with an estimated average of about 50 f.c. One office had a range of from three to 30 f.c., and a few (notably in the most modern industrial plants) had as much as 100 f.c.

Older industrial plants were found to have woefully inadequate lighting for the seeing tasks required. Light ranged from six to 45 f.c. in those studied. They averaged 25 f.c. However, in the modern plants recently built in the Phoenix area, the general illumination level was found to be 65 f.c., with special assembly work being done under light of 225 to 250 f.c.

Supermarkets ranged from an average of 30 to 35 f.c. in older buildings, to 70 to 100 f.c. in newer ones. A brand new store in its first hours of use provided 140 f.c.

It would be unusual to find an average of 15 or 20 foot-candles of light in Arizona homes.

In addition to these studies, we surveyed the lighting conditions of three of our most recently built school classrooms. The survey was made in conjunction with a representative of Arizona Public Service Company, and two foot-candle meters were used, with the results averaged. The readings were taken on a day with bright sunshine and a clear sky, between 10 a.m. and noon. Here is what we found:

(*Continued next page*)

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School	Statistics	Foot-Candles on Desk Tops Lights Off High	Low	Ave.	Lights On High	Low	Ave.	Foot-Candles Artificial Source
A	2 rows 3 concentric ring fixtures with 250 watt silver bowl lamps. 26' x 44' area. 9 ft. Mtg. height windows on north	50	11.5	31.6	61	18.5	40.6	9 F.C.
B	2 rows of 3 concentric ring fixtures for 500 watt silver bowl lamps. 26' x 32' area. Mtg. height 8½ & 7½ ft. windows north wall	94	25	64	125	41.5	80.7	24.7 F.C.
C	2 rows of 3-8 ft. 2 tube fluo. fixtures. 8 ft. Mtg. height. 28' x 28' area. Windows on northeast side	77.5	32	44.4	112.5	50.5	72.8	28.4 F.C.

Under optimum conditions of natural daylight, only one of the areas actually came up to the known recommendation of a minimum of 30 foot-candles, a recommendation which now has been found to be outmoded and inadequate. (See new I.E.S. standards, page 14).

The supplementary illumination supplied by the lighting systems in each case was found to be less than 30 foot-candles, and the classroom in school "A" had an average supplementary illumination from the artificial light of only nine foot-candles.

We found in school "B", where the concentric ring fixtures were used, that the purchasing agent had sought to save a few cents by buying 500 watt clear lamps. These were being used instead of the silver bowl lamps that the fixture required. (See photographs.)

The teacher in that classroom told us about a student sitting just to the rear of the first fixture using the clear lamp. He was having a great deal of difficulty with his eyes and he was frequently absent. His parents' physician, she said, reported that the child was suffering from an extreme nervous condition.

Such cases make it obvious that lighting must be not only of the proper levels for the seeing tasks required, but it is even more important that *quality* illumination systems be designed in which the artificial light sources are directed and controlled to eliminate glare and extremes in brightness.

Low contrasts are the easiest on one's eyes, regardless of the lighting levels. It is only by controlling the brightness and contrast that we are able to produce the artificial lighting systems of 500 to 1,000 foot-candles which many of our extremely difficult seeing tasks require.

The sunlight is wonderful out-of-doors. But with all its blessings, it cannot provide a satisfactory solution to the seeing tasks of our modern indoor and nocturnal society.

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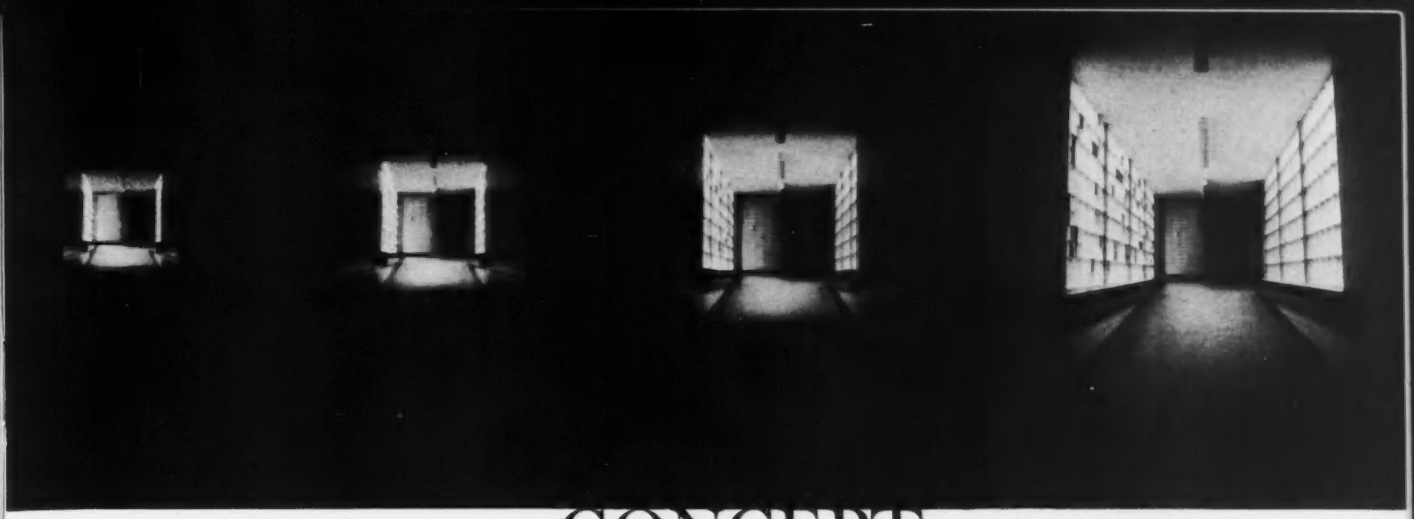

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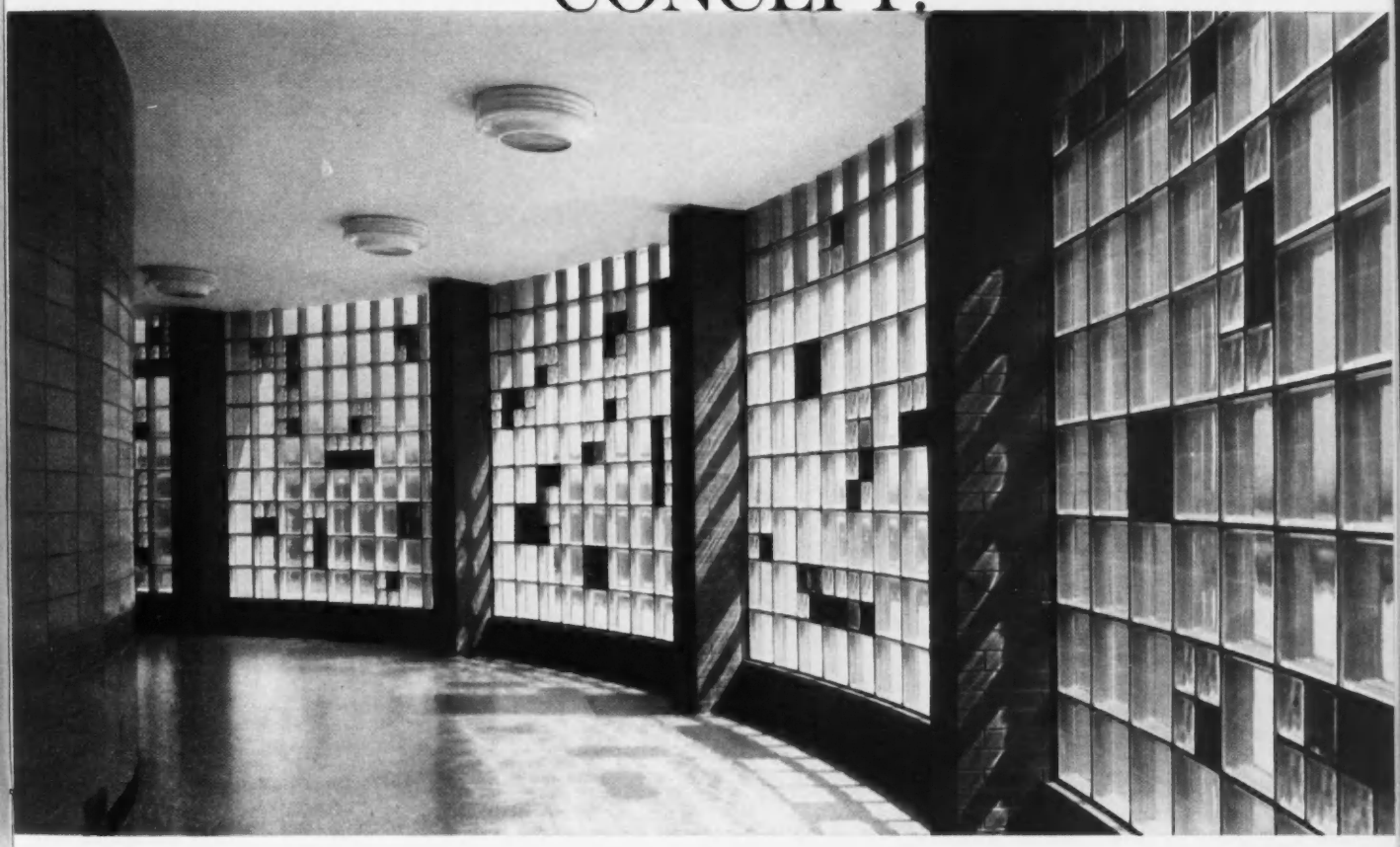

light and color to stimulate a happy mood

Students experience a transition to bright, airy space as they approach a rotunda around administrative offices at the new Springdale Joint Junior-Senior High School, Springdale, Pa. Architects John A. Desmone, A.I.A., Springdale, and Wesley Joseph Henger, A.I.A., Pittsburgh, Pa., call this the happy area. Their design concept: lend an atmosphere of happiness and warmth to the school's center of authority. Skillfully blending PC Vue Blocks, Decora Blocks and the bright accents of PC Color Glass Blocks, they bathed the area in warm natural light and color . . . and found bonus values of good insulation, minimum maintenance and favorable initial cost. *You* may well find a design match for your own concepts in PC Glass Blocks—including 12 face colors and the new **4 x 12** Block. PC Color Glass Blocks are available on architect's specification only. Write for product data. Pittsburgh Corning Corporation, Department E-79, One Gateway Center, Pittsburgh 22, Pennsylvania. In Canada: 3333 Cavendish Boulevard, Montreal, Quebec.

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The Fundamental Factors Of Seeing

The relatively new science of seeing has established the partnership of light and sight. Architects can benefit from a general understanding of the fundamentals of seeing which demonstrate this partnership. A knowledge of these fundamentals can lead to mastery of general principles of design to help benefit from them.

The Cleveland Electric Illuminating Company has compiled fundamentals and design principles from several sources. It lists the four fundamental factors of seeing as:

1. The size of an object.
2. The time required to see an object.
3. The brightness of the object.
4. The contrast of the object against a background.

Size, the company points out, is the simplest fundamental in seeing. Obviously, the larger the detail the easier it can be seen. When an eye specialist checks a patient's vision the large letters on the chart are easily read. But as the size of the letters decreases one eventually is unable to differentiate between them.

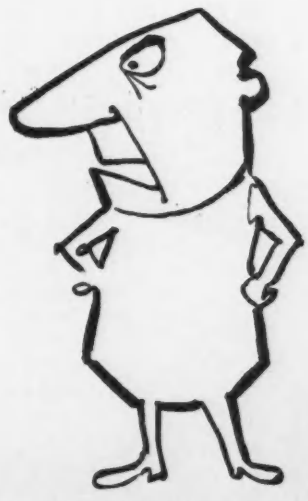
The second factor in seeing is time. It takes time to see. Eyes are like a camera; they take snapshots instantaneously when light is abundant, and time exposures when lighting levels are low. One may read by moonlight, but it is a slow and laborious process compared to reading in the shade of a tree where light is abundant.

The third factor is brightness, which is the primary factor upon which visibility depends. If light did not produce brightness, objects would remain invisible and our visual sense would be useless. It sometimes takes a considerable amount of light to provide enough brightness for us to see minute particles. For example, one is not conscious of dust particles in the air of a room until a shaft of direct sunlight makes them visible.

The fourth factor is contrast. One sees an object more clearly when it stands out against its background. That is one reason why fifth and sixth carbon copies are harder to read than the first carbon. The carbon hasn't been transferred to the paper in as

(*Continued next page*)

"I said to use UNION GYPSUM lath and plaster!"



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FACTORS OF SEEING

large an amount; it therefore is not as dark, so contrast is less.

With these fundamentals in mind, other factors contribute to a good seeing climate. To be considered, according to the Cleveland company, are such factors as the following:

Large area low-brightness luminous ceiling systems supply soft, comfortable illumination. Light is distributed diffusely and evenly throughout the work area, reducing contrasts and shadows to a minimum.

In offices, light finishes of desks and woodwork, pastel walls and light floor coverings all have a high reflectance value. The balanced brightness of these functional elements lead ones eyes about the room without any jolting brightness contrasts. Vividly colored fabrics of the furniture can add to the cheerfulness and attractiveness of the working atmosphere.

Annoying high brightness areas are kept comfortable and within recommended brightness contrast ratios through the use of drapes and blinds.

The contrast ratio between brightest and darkest area in an office should never exceed 10 to one. The brightness of a lighting fixture should never be more than three times the brightness of its background.

Since man is a product of his environment, it is interesting to know under what outdoor brightnesses and contrasts our eyes evolved. Nature has been kind in her contrasts. For example, light barren soil, brick pavement, green grass in sun and hazy blue sky are all within a three to one brightness ratio. One can add the sunny side of trees, grass in shade, dark soil, black cloth and still stay within a 10 to one ratio.

A combination of the fundamentals of seeing and design factors pays off, not only in esthetic value but also in dollars and cents. In office and industrial plant, a quality seeing climate makes for increased production, less rework, improved safety records, better housekeeping and improved quality control. Quality lighting provides better morale and better supervision, improved public relations and more efficient use of manpower.

Sub-standard lighting is expensive.

— AIA —

Some Q's and A's (From Charette)

Q. Cheerful faith that everything will turn out for the best should be the philosophy of architects, don't you agree?

A. Yes. But it makes engineers nervous.

Q. Who is responsible for the fact that site values rather than "sight" values ruled city planning throughout the 19th Century?

A. The land monopolist and his servant, the City Planning Engineer, according to Lewis Mumford.

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THE BIRTH OF A BUILDING

Once conception takes place, the embryonic image must be developed to fulfill its ultimate function as a serviceable building. Now the architect is primarily concerned with problems and their solutions, now he must exercise not only his talents but, to its fullest, his professional craft. He must consider the legal aspects – the codes and ordinances by which society protects itself from ignorance, carelessness and dishonesty. He must exercise his knowledge of economics. He must practice the discipline of constantly checking and rechecking his own work and that of others. Meanwhile the design is growing and changing, as it is expressed in a sequence of protean forms. It appears as words of specifications, drawings of construction details, scores of materials, thousands of dimensions, innumerable conferences, continual inspections and, finally, into the movement of earth, the discipline of steel, the scale and texture of walls. But even now the design has not been delivered. It is only when the people for whom it was conceived are at last living and working in the building that it can be said to have been born.

–William L. Pereira. *Quoted from a panel discussion at the National AIA convention, 1959.*

Dividends Of Good Lighting

An experiment in the Internal Revenue Department at Washington, D.C., conducted by governmental agencies proved that workers processed 5.5 per cent more cards after seeing-conditions were improved. This increase in production was made even though a work change made the job harder. If jobs had remained the same both years, the actual increase would have been 20 per cent. Yearly saving based on the 5.5 per cent figure is still more than double the cost of the better seeing, or a 200 per cent profit on this lighting every year.

Lighting helps in the plant as well as in the office. Erickson Tool Company, Solon, Ohio, installed 250 foot-candles. Production increased 10 per cent. Management estimates $35 per day is saved in time not wasted by workers as formerly done when they adjusted their supplementary lighting.

Austin Company Vice President W. G. Paton says: "We consider good seeing to be one of our best morale helpers and one of our soundest all-around investments. We believe good light is especially important in rooms where a fraction of an inch on a drawing will represent thousands of dollars on time and materials in the final construction."

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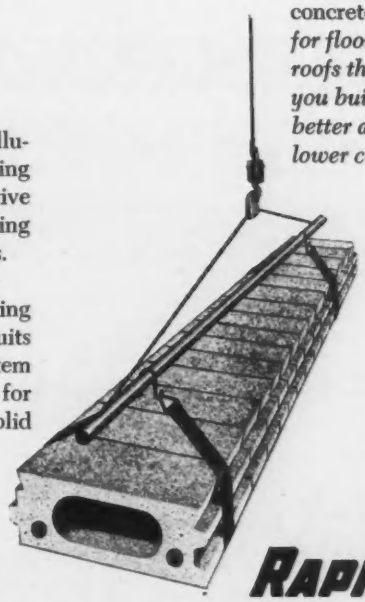

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How Much Light?

New recommendations by I.E.S.

By Glenn A. Baker,
Baker and Moody, Consulting Engineers

Just how much light is required for seeing?

A reasonable answer to such an abstract question and others concerning illumination has recently been sought by the Illuminating Engineering Society through research conducted by Dr. H. Richard Blackwell while he was director of the Vision Research Laboratories at the University of Michigan.

Dr. Blackwell's research contract with the Illuminating Engineering Research Institute began in 1950 and involved a total of 56 laboratory tasks under controlled seeing conditions with, for the most part, college students as subjects. The results of his eight years of laboratory testing have now been developed into a system for field use.

Following Dr. Blackwell's report a special committee of the I.E.S. met to evaluate the information he obtained and to compare and equate the scientific findings with actual field conditions. The committee was composed of the chairmen of the I.E.S. technical committees and other men well versed on lighting problems of their particular fields.

By weighing the laboratory tests against tasks of comparable difficulty, sufficient scientific bases for valid recommendations of illumination levels in other areas were obtained. From the committee's work came a complete table of foot-candle recommendations which is included in the "I.E.S. Lighting Handbook," third edition, 1959. Some highlights:

The current recommended level of illumination is stated as "minimum for the task at all times," comparing to the past recommended level of "average illumination," which was the average measurement of foot-candles from wall to wall. The new recommendation emphatically states, "*Any* place in the room must have light required for tasks performed there."

Schools

Because of the nature of a classroom, a great variety of visual tasks are performed. Lighting must be planned for the most difficult of these tasks. In most grammar schools, daylight can be utilized to supplement the artificial lighting and the control of daylight through proper shielding should be considered part of the lighting engineering.

Currently the recommended minimum level for reading printed matter is 30 foot-candles, whereas the

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level for reading pencil writing is 70 f.c. In a grammar school, since students are reading part of the time and writing part of the time, it would be wise to settle on a minimum of 50 f.c. of *artificial light* supplemented by the daylight available.

Other public institutions, such as high schools and universities, often are used for night classes and community activities. Consequently, artificial lighting alone must provide adequate levels for the tasks involved. Logically 50 f.c. should be used.

Offices

Visual tasks in offices are frequently of the type which change in severity over short periods of time. A person may at one moment be reading a fourth carbon copy of a letter, then a clear original. A draftsman may trace from an old blueprint, then switch to copying from a clear photostat. "Minimum for the tasks at all times" applies here. The new levels list under regular office work 100 f.c. for reading good reproductions; 150 f.c. for accounting, bookkeeping, rough drafting layout; 200 f.c. for designing and detailed drafting. These levels represent a significant increase over previously-recommended levels.

Industrial

Benefits from lighting installations which meet I.E.S. recommendations in industry are more evident and documented than in any other area. Records show that increased production, fewer rejects, faster inspection and reduced numbers of accidents easily offset the cost of an adequate lighting installation in a very short time, to say nothing of improved worker morale.

Lighting maintenance programs in industrial plants should be on a more frequent schedule than in most areas. A planned maintenance schedule for cleaning and relamping increases the overall efficiency in such plants. The problems of maintenance should be of concern to the lighting engineer.

Representative values for industrial areas are listed, including 70 f.c. for airplane manufacturing; 50 f.c. for sheet metal, ordinary bench work; 500 f.c. for fine assembly; and 1,000 f.c. for such work as the extra fine assembly needed in transistor manufacturing.

Great strides have been made in the field of illumination, but researchers are constantly at work striving to obtain the ultimate in lighting levels.

Research is now being done on the relation of quantity of illumination and seeing for older eyes; the relation of quality of illumination and focusing; and studies involving different field factors.

A "Visual Task Evaluator" will be an important instrument for converting the static laboratory task into normal field conditions. More information will be sought to determine how well it represents other types of practical tasks.

Past research has provided a basis, backed by scientific experiment, for determining how much light we need. There is good reason to be excited by the progress made in illumination research.

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Light — Basic Element Of Design

Unless the architect accepts the challenge he may be called a daytime designer

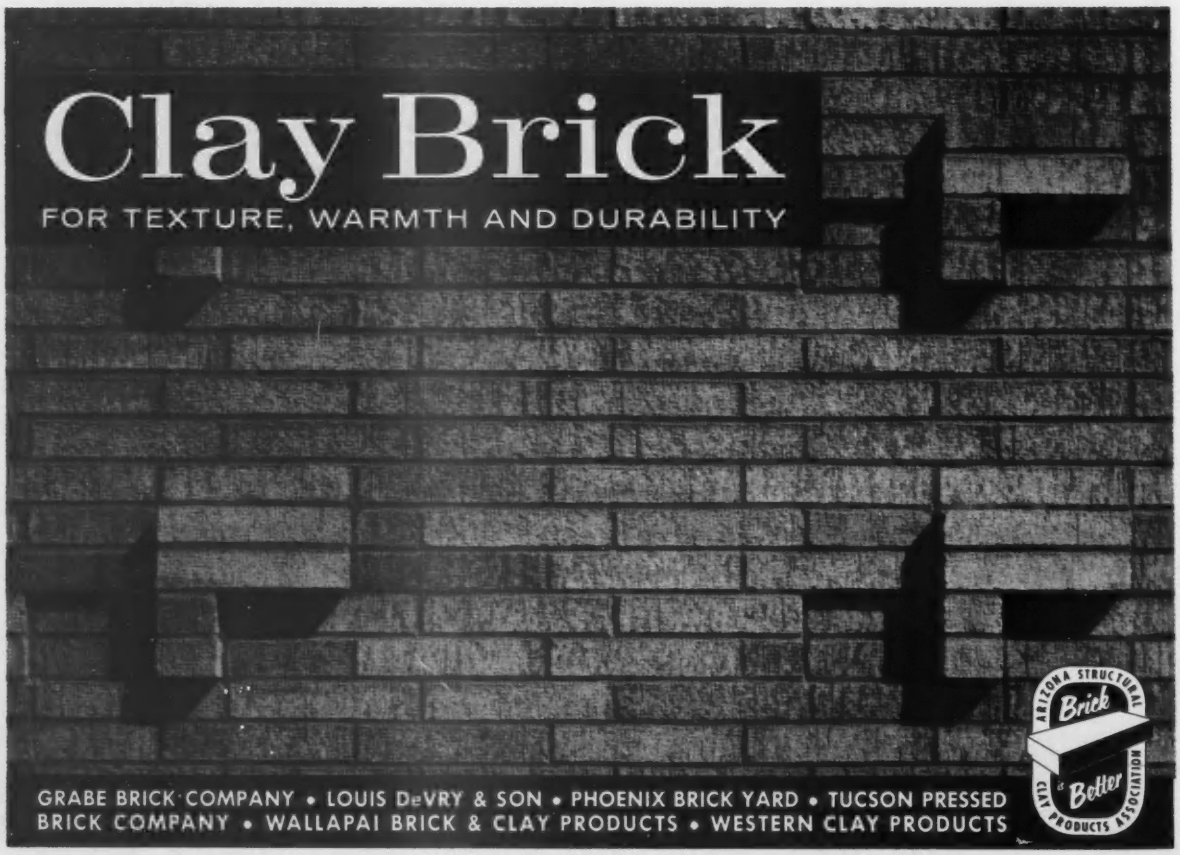
By Stanley McCandless,
Century Lighting, Inc., New York

(Editor's note: The following provocative material is excerpted from a talk by Mr. McCandless at the national AIA convention in New Orleans in June.)

Light has been the basic medium of design since the beginning of time, but its production and control by artificial means in recent years makes it possible to think of it as a new means of expression, even as a new building tool. Our whole visual education in design is almost completely conditioned by natural lighting. Yet of late years . . . a vast world of artificial lighting effects and environments has conditioned our concepts of design. x x x

Design with artificial lighting is a most modern and important subject today. The artist and the architect are slowly becoming aware of the fact that lighting is their problem and that it is a problem of design. . . . Illuminating engineers have shown great skill in producing results from unusual designs, but they can only succeed when the designer presents an idea which is more or less technically feasible. Lighting is technical in its execution, and this is the engineers' province. It is not, however, basically an electrical engineering problem. . . . The prevalent misconception is that the illuminating engineer can be expected to assume the initial responsibility of determining the design of the visual effect as well as the technical problem of execution. . . . Every lighting job in its inception, except the most functional, deserves the attention of a trained designer of visual effects.

All architectural design has been based to such a large extent on the uncontrolled conditions of natural illumination, but we are all basically daytime de-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signers. . . . Yet we live and work in an environment which depends almost completely upon artificial light. For most of us city dwellers this means seven-eighths of our waking hours, a startling figure which indicates that the light in interiors is almost completely artificial and that the extension of our activities out-of-doors after nightfall is completely dependent upon man-made light.

This is a challenge to – and a responsibility of – the designer, and unless he accepts both, he may be called a daytime designer. No modern designer can afford to overlook or avoid the present responsibility and opportunity. Lighting today has many features of a new building material. x x x

Up to this point, in our schools, the young architect is given very little formal training in lighting. . . Only in the theater has the designer been given almost unlimited scope of expression. . . . The scenic designer knows that he must work with artificial light. He also knows that he will have a most flexible machine and generally an ample budget to work with. He will have time and facilities to adjust intensities and distributions with dimmers. . . . He can make the stage set take on a visual character suitable to widely different situations.

Lighting in architecture may never be as flexible or dramatic as we find it in the theater, but ultimately every designer hopes he can re-create a visual aspect, an atmosphere or a special composition which he must know can only be created through the control of artificial lighting. He must ask himself how artificial light can contribute to architectural design.

The functions of artificial light in architecture are to provide **visibility, comfort, composition** and **atmosphere.** These are general terms which need clarification and definition, but they help break down the problem into separate objectives which, with all of the other factors in architectural design, must be integrated as seeing elements with the rest of the structure.

Visibility has to do with the control of the complete gamut of sensitivity from threshold, where details are scarcely recognizable, to saturation where the eye can no longer see detail because of excessive stimulation. **Lighting should reveal things in proportion to their importance.** It is just as important to conceal irrelevant and insignificant details as it is to reveal those which set the whole key in the visual pattern.

• The amount of light falling on an object or being transmitted from it to the eye is generally proportional to its visibility. x x x

• Color, particularly in light, has very little effect on visibility, except in the extreme limits of the spectrums – reds, blues and purples. It is always easier to see things in the illumination near the central zone

(*Continued next page*)

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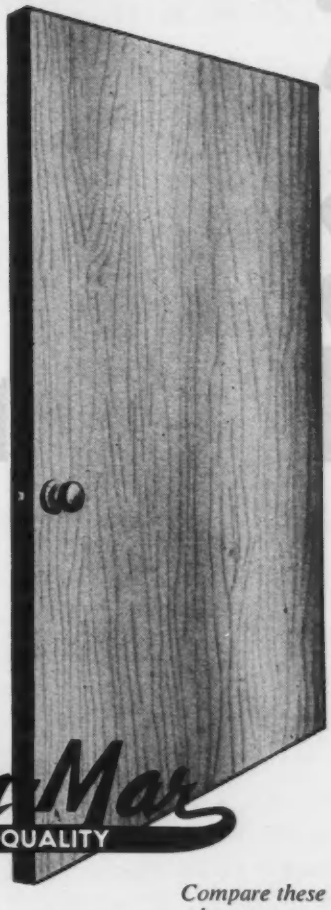

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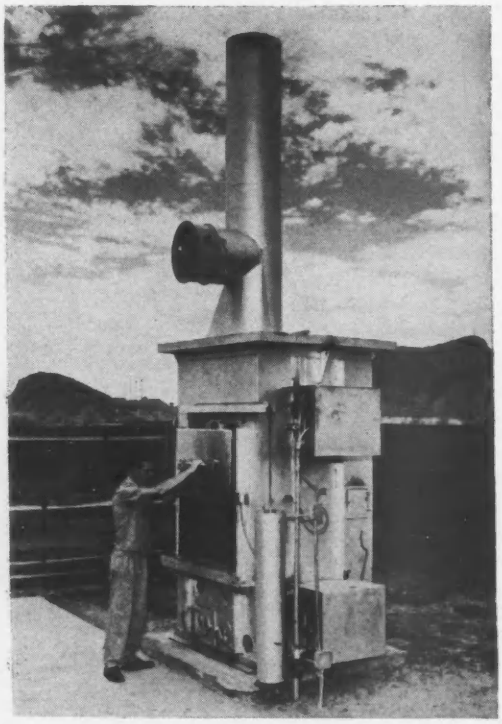

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LIGHT — BASIC ELEMENT OF DESIGN

of the spectrum, for example, the yellows, than it is in blues and reds and it is always easier to see under a diluted color approaching white light than it is in the pure wave length of any color.

• The distribution of light is, by all odds, the most important factor in seeing detail; contrasts in light, shade and color always promote a sense of plasticity and form. The size of the object obviously is important because below a certain size, the eye does not see detail. Age has something to do with it, in that we tend to require larger print or the aid of glasses as we get older. More light or greater contrast is desirable in this case.

• Movement has only an indirect effect on visibility, in that we tend to see things more clearly the longer we study them. Quite obviously, if the designer wishes to suppress a view of certain details, they should not only be small, of low contrast and illumination, but the observer should not be encouraged to study them carefully.

Comfort is one of the imponderables generally accepted by the architect as a basis for his design. Air conditioning, acoustical treatment, the feel of materials and, now lighting, come more completely into this picture. Obviously, lighting alone has very little influence on the body comforts except that of seeing, but good lighting is essential to the feeling of comfort.

• The optimum amount of light as a standard for various functions is increasing. . . . As costs, heat loads and glare factors are gradually overcome it is quite possible that we will continue to accept higher levels of illumination as more comfortable than low.

• Color has very little to do with comfort, except in an esthetic way. However, we do know that it is difficult to see easily in high levels of red and blue. . . . and the greatest comfort generally comes with the use of white light.

• The control of the distribution of light for comfort is a tough problem. We have not yet learned in ordinary lighting practice to reduce brightness contrasts in the normal field of vision to a comfortable point. Until we learn how to control brightness ratios in terms of comfort, we can scarcely have entirely satisfactory compositional lighting effects.

• In terms of movement, flicker or even fluctuations in the amount of light or color of light can quickly create an unbearable situation. x x x We still have a great deal to learn in terms of comfort in artificial illumination as compared with natural light, but we now do have control over movement.

Composition is the keystone in the designer's technique. It need only be reiterated here that with the means whereby we see under control, design in terms of artificial light has a promising future. A new dimension of expression has been added to the philoso-

phy and technique of the heretofore daytime designer.

- The intensity of light under control can reveal objects or suppress them, as never before possible in nature. x x x The brightness range at present in artificial light is a little out of hand in terms of composition. The brightness pattern in the field of view will always be more vivid than a painting, for example, but we should learn to control it with the same skill as a painter.
- Color in terms of composition can be blatantly enhanced by colored light. In fact, it is not strange that the average sensitive designer shies away from the use of colored light for this reason. It is a great challenge and a powerful tool which we hope will engage the designer more completely in the future.
- Distribution of the pattern of light is almost synonymous with composition and we see it most vividly exploited on the stage . . . Store windows have exhibited a great appreciation of this function of artificial light and the same spirit has gone into the store, in many cases, and proved to be an economic asset, even though it cost more on paper at first. Actually, the costs of controlled lighting are puny, compared to the economics of air conditioning and even acoustical treatment.
- Movement is the touchstone of vitality in design. All the fine arts – painting, architecture, sculpture – in daylight are frozen images. Under artificial light they come alive and are vitalized, even to the point of taking on the guise of musical compositions. . . . The colored fountains and the spectacles of light and sound now popular in Europe are example of this control of light.

Atmosphere is important. Whether we like it or not, every visual experience is translated in the mind as having a certain mood. Architects reluctant to face this problem have made a very important place, as a result, for the interior designer or decorator. Atmosphere created by light is an imponderable, dealt with mostly in the theater, but the designer should be aware of the general possibilities for creating a particular atmosphere by means of light.

- Intensity is generally associated with brightness for gaiety, with dimness for tragedy.
- Color is generally used as follows: warm for comedy or gaiety and cool for tragedy or subdued atmosphere.
- Distribution is generally associated in terms of details with playfulness or comedy, and masses with tragedy or formality.
- Movement is fast for comedy, slow for tragedy.

The great possibilities of lighting for the designer are without any real tradition, yet we can find examples as old as architecture itself. Today, with new sources, new instruments, new methods of control and new concepts, the designer has a much broader field of expression than he ever had before, and only he can put them to proper use.

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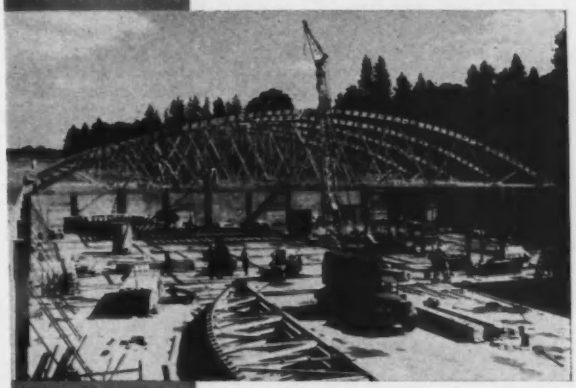

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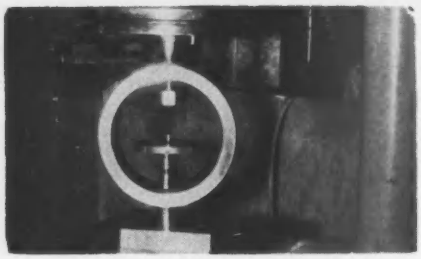

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Later he returned, mauled, clawed. After redoing most of task No. 1 he again staggered out the door. Minutes later he returned and asked: "Where is that Eskimo woman I'm supposed to shoot?"

Next month: "Confused Meanings"

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Farce-odd

Is the pun we've pulled as an "architectural term" for this column too awful? In fact, are the attempted humor and oddities something you want in your magazine? Tell us on or tell us off. We want to save fascia know. (!)

• • •

After Em Scholer read our recent reproduction of a page from a 1755 English edition of "The Architecture of Leon Batista Alberti," in which most of the letters "s" appeared as "f", he infifts he ftarted to lifp when he finifhed.

• • •

An ad correction that stopped our presses: "Laboratory technicians are trained to make and handle concrete cylinders. Each is properly filled and rodded . . . " The corrected version: "Laboratory technicians are trained to make and handle concrete cylinders. Each *cylinder* is properly filled and rodded . . "

• • •

Pity the fate of the architect who would consider no style but classic Greek. He finally went baroque.

• • •

From the executive secretary's landlord: "Would you believe it! This apartment building was designed by a 19-year-old boy." (P.S. He lost a lessee.)

• • •

There's a lesson for architects in the recent experience of a public school administrator who used his professional lingo on parents, with unexpected results.

A questionnaire asked if the pupil had any siblings. Some parents said they didn't know but would ask their doctor.

• • •

Arizona's new legislative chambers are nearing completion, but it's touch and go whether they will be ready for the present legislature to sit in them for its last regular session starting in January.

So anxious are the lawmakers to enjoy their new architecture that Sen. Sullivan has suggested they might meet on schedule, then immediately adjourn for a few months until the buildings are complete.

• • •

A sculptured stone panel on Valley National Bank's Security Building office features stags — fighting bucks. The bucks we've gotten from the bank sure had a lot of fight in 'em. They invariably got away.

• • •

The May issue of *Horizon* says of the Grand Seraglio's harem: "No one now knows what it looked like. The drawing was made by an architect who . . . could not enter the harem."

Guess they knew him to be a man with designs.

You never know when your words will come right back at you. When we opened up the July issue of Kansas City Chapter's neat little publication the words "Do-It-Yourself School Buildings" caught our cornea. The familiar words headed up their reprint of our May editorial quoting Francis Bricker's reaction to the Phoenix Union High School publicity on a proposed school plan.

The Arizona Republic, editorializing on conditions at the state prison, recently suggested that we might be subjecting prisoners to cruel and inhuman punishment. (See *Arizona Architect* Feb. '59).

* * *

Across our telephone wires: "Could you please give me the name of an architect who does real palatial houses? I've got plenty of money and don't want any of these modern things."

Anybody done a palace lately?

* * *

Request from a builder: "I'd like the name of an architect who will just sit down and draw, draw, draw! None of these young fellas who'll argue; just a guy that wants to draw, draw, draw!"

Any applicants?

— AIA —

There was a time in architecture when landlord and designer combined their efforts to attract tenants by superior planning rather than "12 cubic foot refrigerators, colored bathroom tiling, television antenna and air conditioning outlet." Sibyl Moholy-Nagy

TIMES CHANGE

Edison and his carbon filament brought the wonders of better light to *see* by. But times change, and today we relish the light we *live* by. Light surrounds our living . . . cheers our lives . . . beautifies our homes. We live with light . . . light lives with us.

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HARDWARE TIPS

By Veron Junger

A HANDY HINT

Correct hardware scheduling for commercial buildings must include the proper "handing" of doors. This is because many door closers, floor checks, overhead door holders, panic devices and some lock functions are not reversible.

Some people are confused about how to "hand" doors, but it's not really difficult. Exterior, corridor and hall doors are "handed" from the outside – that is from the key side of the lock, the side from which security is desired. In the case of interior connecting doors "hand" is judged from the side from which you cannot see the hinges. There are only four possible "hands":

Left-hand door – Hinged on your left; opens away from you.
Right-hand door – Hinged on your right; opens away from you.
Left-hand reversed door – Hinged on your left; opens toward you.
Right-hand reversed door – Hinged on your right; opens toward you.

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THE PACKAGE DEAL

"Is the challenge of the building-package operator a sign that the architectural profession must re-evaluate its traditional field of service and, perhaps, widen its range of professional concern?" This is the question that the Florida Association of Architects proposed to analyze and answer during its 44th annual convention at Miami Beach. A three-man panel spoke in a room crowded with architects seeking advice on a problem of practice which has lately appeared to be growing in size and in importance. The results of that discussion were reported in a recent issue of *The Florida Architect*, the official journal of the Florida Association of Architects, AIA.

A published reprint of that report has been named Document of the Month by the AIA, and persons interested in the results of one of the first comprehensive seminars ever to be held on the subject, may obtain copies from the Institute.

Much of the value of "The Package Deal" rests in its analytical and articulate statement of the architect's postion in the building field today, where changes have ". . . upset many of the principles, policies, and documents contained in the AIA Handbook of Professional Practice." The panel clarified the need for the architect to maintain his professional approach, yet not alienate himself from the groups who deal in the large variety of "packages" which are being offered to the building public. These "packages" are defined as any building program which seeks to eliminate professional service and thus, unknown to him, works to the disadvantage of the prospective owner.

Of further interest is the discussion of the AIA code of ethics, seen by some as a handicap lacking realistic effectiveness with respect to current conditions and needs, and in need of revision.

– AIA –

MODULAR BUILDING STANDARDS ASSOCIATION REPORTS

The second issue of MBSA REPORTS has been released in the form of an attractive and informative packet. The report details the accomplishments of the MBSA's first year of operation, and announces plans in progress, aims for the future.

As in REPORTS No. 1, this issue contains reprints, clippings, symposium reports and announcements of administrative activities. The modular products section contains a summary of the dimensional requirements for products to qualify as "modular." Of particular value is the comprehensive bibliography of publications on modular design and construction.

The association summarizes its year of activity by suggesting that the services of MBSA can continue to expand until the " . . . rest of the construction industry is, in fact, a *modular* construction industry."

CRITÍQUE

EDITOR, ARIZONA ARCHITECT

Our congratulations on your fine post convention issue which we received the other day. It is a joy to know that one more architectural writer, at least, recognizes the fact that, journalistically speaking, architects put on their pants one leg at a time, like everybody else.

We have a tendency to become incensed at those who insist upon impressing the readers with their vast vocabulary, rather than the thought they're trying to put across, if any.

Welcome to the club.

GREGORY M. FRANZWA
Public Relations, St. Louis, Mo.

EDITOR, ARIZONA ARCHITECT:

Have just returned and am tackling the pile on my desk. Had a fine trip and occasions to study the 'native genius' of Scandinavian builders from the Bronze Age up to present time, with much admiration for the earlier ones. Modern architecture is well planned from a social standpoint, but too imitative of our steel and concrete style structurally. But they sure are building! Give me a ring any time and I shall start the coffee kettle.

ODD S. HALSETH, *Supt.*,
Division of Archaeology
Pueblo Grande Museum, Phoenix.

EDITOR, ARIZONA ARCHITECT:

The article in this (modular) issue of *Arizona Architect* was well-handled. In fact the entire issue is excellent. It should give a lot of the offices something to think about — to change their old-fashioned ways. We have to be reminded sometimes even of things we think we know about.

Please send me six copies of this issue.

FRED H. JOBUSCH, AIA, *Tucson*

— AIA —

NEW ASA BOOKLET

Many questions concerning the standardization activities in the construction industry are answered by a new publication called "Current Projects of The American Standards Association," just released by ASA.

A total of 425 American Standard projects are described in the 52 page booklet. In addition to listing the projects under ASA's 19 Standards Categories, the booklet describes the scope of each project, provides an index and lists the sponsors.

ASA is the coordinating body for voluntary national standardizations in the U.S., and also represents U.S. interests in international standards work.

Available from ASA, Dept. 94, 70 East 45th St., New York 17, N.Y., the price per copy is 75c for members, and $1.50 for non-members.

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Here's an authoritative informational monthly program offering new uses and design ideas for unit masonry in buildings.

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"MORTARS FOR UNIT MASONRY"

DATE:	Friday, October 23, 1959
TIME:	12:00 to 12:40 p.m. — lunch 12:45 to 1:35 p.m. — program
PLACE:	Arizona Ranch House Inn 5614 North Central Avenue Phoenix, Arizona

Each monthly luncheon meeting will be filled with facts and data that are vital to everyone concerned with architecture.

EXACT DATES AND SUBJECTS OF FUTURE LUNCHEON MEETINGS DURING THE 1959-1960 PERIOD WILL APPEAR IN THE "AIA ARIZONA ARCHITECT."

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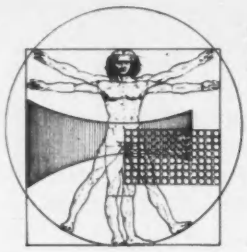

EIGHTH REGIONAL CONFERENCE
WESTERN MOUNTAIN DISTRICT
AMERICAN INSTITUTE OF ARCHITECTS

SCIENCE IN ARCHITECTURE

OCT. 8-9-10

ALBUQUERQUE, NEW MEXICO

The Eighth Western Mountain Regional Conference of the American Institute of Architects will meet for three days at the Western Skies Hotel in Albuquerque, New Mexico, October 8 through 10.

Among the notable guest speakers will be Governor John Burroughs; Dr. Clayton S. White, Director of Research for the Lovelace Foundation; Dr. Herman Von Spoomo, outstanding scientist; Herbert H. Swinburne, noted architect from Philadelphia who is actively on the Research Committee of the Institute; Dr. E. J. Workman, President of New Mexico Institute of Mining and Technology at Socorro; and Mr. C. H. Topping, Senior Architectural and Civil Consultant of the Design Division of E. I. du Pont de Nemours, & Co., Inc., in Wilmington, Delaware.

Also scheduled for the three day conference are luncheons, sightseeing tours, dinners and cocktail parties, designed for the entertainment of the architects and their wives.

Conference Attendance Pays

By David Sholder, AIA

With the Eighth Regional Conference of the Western Mountain District of the AIA to be held at Albuquerque, New Mexico, October 8-9-10, it is time to make plans to attend this conference. Regional conferences are places where we can lay aside for a few days the cares and responsibilities of our offices, where we can meet old friends, former classmates and new acquaintances. Thoughts of our fellow practitioners as competitors are forgotten and we can sit down in a relaxed atmosphere to discuss common problems, exchange ideas on design, construction, and office procedure. We can rub elbows with the top men of our profession and in the world of science whose work has made the headlines. We find these talented individuals usually prove to be ordinary men like ourselves.

I realize that many members can't attend because of business commitments, and many face the problems of getting the children back to school, the adjustment to the routine of school hours, homework and, most important, of finding a proper person to look after them. But the effort to get away is worth it, and you can look forward to many diversified activities, both educational and entertaining. The ladies in particular look forward to these conferences and always have a good time.

CENTRAL ARIZONA CHAPTER NEWS

• Members of the Central Arizona Chapter have been working during July and August with members of the Arizona Masonry Guild. Martin Ray Young, Jr., has met several times with representatives of the Guild to help draft a program the Guild plans to present during the 1959-1960 period that would be of interest to architects and structural engineers. The Guild is scheduling the programs as luncheon sessions to be held generally on the fourth Friday of the month starting in October. The October session will deal with the subject of mortar.

Jimmie Nunn, Kemper Goodwin and Ralph Haver have been meeting with and advising the Guild's mortar committee.

CSI MEETING CHANGE

In the past the Central Arizona Chapter, Construction Specifications Institute, held their meetings at the ABC Club. Effective with their September meeting, dinner meetings will be held at the Desert Sun Motel, 1325 West Grand Ave. Cocktails will be served from 6:30 to 7:00 p.m., dinner at 7:00. All architects, engineers, and specifications writers are invited to the dinner sessions, held regularly the third Wednesday of each month. The September program features a panel discussion on "What's wrong with our specifications?"

SOUTHERN ARIZONA CHAPTER NEWS

• Gus Knabe, AHC, was the special guest at the chapter's meeting, held Wednesday, September 2nd at the Elks Club dining room. The occasion honored Knabe's retirement as manager of the hardware department at a local lumber company since 1920. A native of Alabama, the hardware specialist also served as a Colonel in WW II.

Early consideration is being given the plans for the 1961 Regional Convention to be held in Tucson. Speculations include ideas for a theme, dates of the conference, speakers, accommodations and social activities.

Local members of the American Society of Landscape Architects will be invited to share the regular meetings. Tucson members of this allied profession include Guy Greene, Joseph Folkner, Raymond Wilcox and Howard Franks.

NEW REGISTRANTS

The State Board of Technical Registration has announced that on August 3, 1959 the following architects were registered and certified in Arizona:

W. P. Hazard, P.O. Box 4174, Tucson; Ross L. Jensen, 207 E. Camelback Rd., Phoenix; John Modifer, 3825 W. Hazelwood, Phoenix; Robert Edgar Olsen, 3027 W. San Miguel, Phoenix; Benedict R. Brout, Los Angeles; Frederick M. Edson, 210 S. Country Club, Tucson; Philip Koenig, Chicago; Wilburn McCormick, Webster Groves, Mo.; Harold Sadler, San Diego; and Harry Wilson, Van Nuys, California.

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IN THE BOOK WORLD

SANTA FE, by Oliver La Farge. Univ. of Oklahoma Press, $5.95. Architects attending the regional AIA conference in Albuquerque in October will enjoy this "autobiography" of Santa Fe, as related in her century-old newspaper, "The New Mexican." With connective passages by La Farge, Pulitzer Prize novelist, this is an authentic record of the history, politics, architecture, artists and Indians of New Mexico.

"There are few greater follies than dedication without reservation to current concepts of 'progress' and 'modernity'. Decade by decade the concept of progress changes. In 1957, Santa Fe hailed as its most important act of progress the passage of an ordinance to preserve historic architectural styles. In 1890 it was to get rid of every trace of 'Mexican' culture. 'Modern' meant brick or stone, bay windows, turrets, jigsaw work, and, if possible, some fairly conspicuous stained glass. In the 1920's and 1930's competent architects could, if they wished, make a good living in Santa Fe at nothing but the remodeling and conversion of such structures to the appearance of native adobe construction."

This book will make you want to include Santa Fe in your trip to the Conference. —P.S.

. . . LENDING LIBRARY

The following publications are presently available on a loan basis from the **Arizona Architect** office, 1423 N. 3rd Avenue, Phoenix:

ACCOUNTING FOR NON-ACCOUNTANTS; John Meyers
AMERICAN ARCHITECTURE, AN; F. L. Wright
ARCHITECTURAL PHOTOGRAPHY OF HOUSES: R. C. Cleveland
ARCHITECT AT MID-CENTURY, VOL. I: Evolution and Achievement: ed. by T. C. Bannister
ARCHITECT AT MID-CENTURY, VOL. II: Conversations Across the Nation; ed. F. Bellamy
ARCHITECTURE AS SPACE; Bruno Zevi
ATHENS IN THE AGE OF PERICLES; Chas. A. Robinson, Jr.
AT HOME WITH TOMORROW; Carl Koch
BUILDERS' HOMES FOR BETTER LIVING; A. Q. Jones, Frederick E. Emmons
BUILDINGS FOR INDUSTRY; F.W. Dodge Corp.
BUILDINGS FOR RESEARCH; F. W. Dodge Corp.
CLIMATE & ARCHITECTURE; Jeffrey E. Aronin
CONTEMPORARY CURTAIN WALL, THE; Dudley Hunt, Jr.
CONVERSATIONS WITH ARTISTS; Selden Rodman
DOCUMENTARY HISTORY OF ART; ed. by E. G. Holt
ESTIMATING GENERAL CONSTRUCTION COSTS (revised); Louis Dallavia
EXECUTIVE PUBLIC SPEAKING TECHNIQUES; Harry Simmons
EXPLODING METROPOLIS; ed. of Fortune
EYE OF MAN, THE; Selden Rodman
FUTURE OF ARCHITECTURE, THE; F. L. Wright
GINGERBREAD AGE, THE; John Mass
GUIDE TO WESTERN ARCHITECTURE; Vol. II; John Gloag
HISTORY OF WORLD ART; Upjohn & others
HOUSE OF YOUR DREAMS, THE; W. A. Kirkpatrick
INDIAN ART OF MEXICO & CENTRAL AMERICA; Miguel Covarrubias
INVESTIGATION OF THE SMALL HOUSE; Pratt Institute
JAPANESE GARDENS FOR TODAY; D. H. Engel
LOOKING AT ARCHITECTURE IN CANADA; Alan Gowans
MODERN CHURCH, THE; E. D. Mills
NATIVE GENIUS IN ANONYMOUS ARCHITECTURE; S. Moholy-Nagy
NATURAL HOUSE, THE; F. L. Wright
ONE HUNDRED YEARS OF ARCHITECTURE IN AMERICA; Frederick Gutheim
PARKING; G. Baker & B. Funaro
QUALITY BUDGET HOUSES; K. M. Ford & T. H. Creighton
RECORD HOUSES OF 1958; F. W. Dodge Corp.
REINFORCED CONCRETE IN ARCHITECTURE; A. A. Raafat
RELIGIOUS BUILDINGS FOR TODAY; F. W. Dodge Corp.
SAVING DOLLARS IN BUILDING SCHOOLS; W. Taylor
SCHOOLS FOR NEW NEEDS; F. W. Dodge
SCHOOLHOUSE; ed. by Walter McQuade
SELLING HOUSES SUCCESSFULLY; A. Gross
SHOPS & STORES; Morris Ketchum, Jr.
SOLAR CONTROL & SHADING DEVICES; Olgyay & Olgyay
STORY OF THE TOWER, THE; F. L. Wright
TESTAMENT, A; F. L. Wright
WEATHER CONDITIONED HOUSE, THE; Groff Conklin

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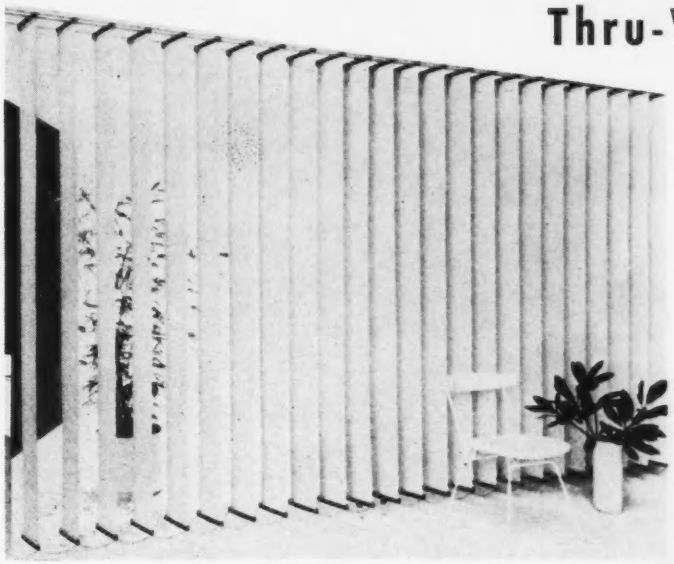

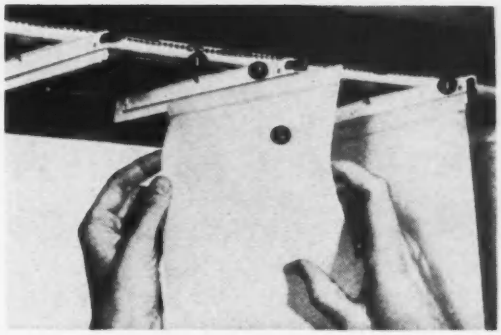

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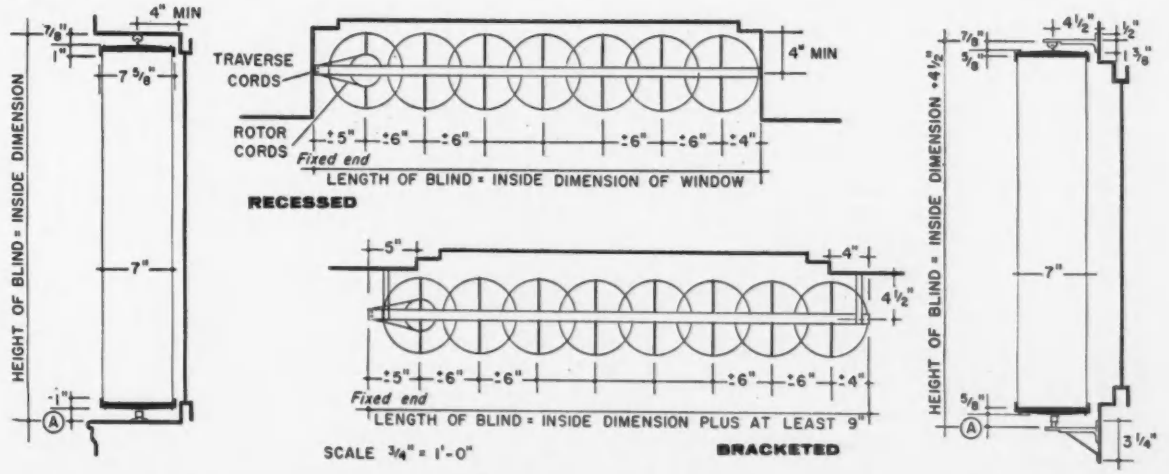

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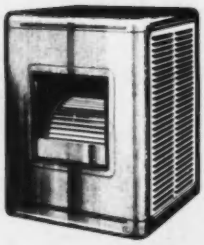

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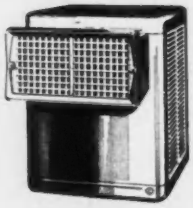

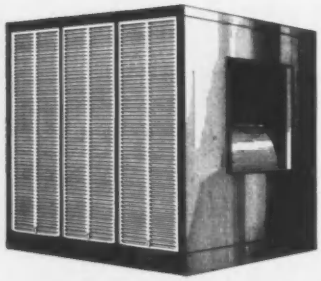

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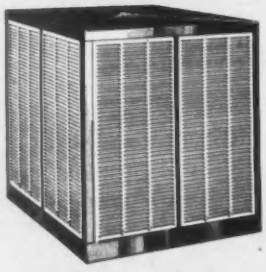

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